भारतीय मानक

Indian Standard

IS 10898 : 2023

प्रबलित आटा — विशिष्टि

(पहला पुनरीक्षण)

Fortified Atta — Specification

(First Revision)

ICS 67.060

भारतीय मानक ब्यूरो
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March 2023 **Price Group 4**

Foodgrains, Allied products and Other Agricultural Produce Sectional Committee, FAD 16

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee had been approved by the Food and Agriculture Division Council.

Atta is prepared in India by grinding whole wheat either in small stone mills operated by animals or human labour, in larger mills using mechanical power or in large roller flour mills. In an effort at nutritional upgrading, fortified wheat *atta* to which vitamins and minerals have been added is at present being prepared and marketed in the country. This standard is expected to help in exercising proper quality control in the manufacture of fortified *atta* of good quality under hygienic conditions.

This standard was originally published in 1984. This first revision has been brought out to harmonize the requirements of fortified *atta* with the specifications laid down in the *Food Safety and Standards (Food Products Standards and Food Additives) Regulation,* 2011 and *Food Safety and Standards* (*Fortification of Food*) *Regulations*, 2018 and the major changes include:

a) Physico-chemical requirements have been updated;
b) List and levels of mandatory micronutrients have been modified;
c) Permitted optional micronutrients has been updated;
d) Chemical sources of micronutrients have been modified; and
e) Test methods for quantification of micronutrients have been updated.

Separate Indian Standard have been published for *atta* (IS 1155), fortified *maida* (IS 10899), fortified barley powder (IS 10900), *paushtik atta* (IS 10901), *paushtik maida* (IS 10902) and *paushtik* barley powder (IS 10903) have also been published.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and the Rules and Regulations framed thereunder and the *Legal Metrology (Packaged Commodities) Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the committee responsible for the formulation of this standard is listed in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FORTIFIED *ATTA* — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for fortified *atta*.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below:

IS No.	*Title*
IS 1070 : 1992	Reagent grade water — Specification (*third revision*)
IS 1155 : 2022	*Atta* — Specification (*third revision*)
IS 1699 : 1995	Methods of sampling and test for food colours (*second revision*)
IS 2491 : 2013	Food hygiene — General principles — Code of practice (*third revision*)
IS 3984 : 2002	Textiles — DW-Flour bags — Specification (*first revision*)
IS 12100 : 1987	Specification for high density polyethylene (HDPE) woven sacks for packing flour
IS 12074 : 1987	Method for determination of lead by atomic absorption spectrophotometer
IS 14818 : 2017/ISO 24333 : 2009	Cereal and cereal products — Sampling (*first revision*)
IS 16287 : 2015/ISO 16050 : 2003	Foodstuffs — Determination of aflatoxin B_1 , and the total content of aflatoxins B_1, B_2, G_1 and G_2 in cereals, nuts and derived products — High performance liquid chromatographic method
IS 16639 : 2018/ISO 20633 : 2015	Infant formula and adult nutritionals — Determination of vitamin E and vitamin A by normal phase high performance liquid chromatography
IS 16640: 2018/ISO 20634 : 2015	Infant formula and adult nutritionals — Determination of vitamin B_{12} by reversed phase high performance liquid chromatography (RP - HPLC)
IS 17669 : 2021/ISO 21470 : 2020	Infant formula and adult nutritional's simultaneous determination of total vitamins B_1, B_2, B_3 and B_6 enzymatic digestion and LC-MSMS
ISO 15151 : 2018	Milk, milk products, infant formula and adult nutritionals — Determination of minerals and trace elements — Inductively coupled plasma atomic emission spectrometry (ICP-AES) method
ISO 21424 : 2018	Milk, milk products, infant formula and adult nutritionals — Determination of minerals and trace elements — Inductively coupled plasma mass spectrometry (ICP-MS) method

3 REQUIREMENTS

3.1 Description

The fortified *atta* shall be prepared from wheat grains by grinding and milling processes, followed by blending with micronutrients namely iron, folic acid, vitamin B_{12} and prepackaged ready for sale to the consumer or destined for use in other food products. The material shall have characteristic taste and smell; it shall be free from objectionable flavours or odours. It shall be free from fungus infestation, rodent hair and excreta. It shall neither have any ingredients other than those specified nor any extraneous matter.

NOTE — The appearance, taste and odour shall be determined by sensory evaluation tests.

3.2 The levels of iron, folic acid and vitamin B_{12} in fortified *atta* shall be as specified in Table 1.

3.3 In addition to the micronutrients recommended in **3.2,** fortified *atta* may also be fortified with zinc, vitamin A, thiamine, riboflavin, pyridoxine and niacin, singly or in combination, in the levels specified in Table 2.

3.4 Food Additives

The product shall not contain any food additive.

3.5 The metal contaminants and other toxic substances, if any, in the product shall not exceed the limits specified in Table 3.

3.6 The pesticide residues, if any, in the product shall not exceed the limits as prescribed in the *Food Safety and Standards (Contaminants, Toxins and Residues) Regulations,* 2011.

3.7 Hygienic Conditions

The product shall be manufactured, packed and stored under hygienic conditions in licensed premises (*see* IS 2491).

3.8 In addition to the above, fortified *atta* shall also comply with the requirements specified in Table 4.

Table 1 Requirements for Level of Fortification (Mandatory Micronutrients)
(*Clause* 3.2)

Sl No.	Micronutrient	Chemical Form of Micronutrient	Level of Fortification	Methods of Test
(1)	(2)	(3)	(4)	(5)
i)	Iron, mg/kg	Ferrous citrate or Ferrous lactate or Ferrous sulphate or Ferric pyrophosphate or electrolytic iron or Ferrous fumarate or Ferrous Bisglycinate	28 to 42.5	AOAC 944.02 or AACC 40-70.01 (total iron present in ferric form) by Atomic Absorption Spectroscopy or Spectrophotometry or AOAC 984.27 using ICP Emission
		or;		
	Iron, mg/kg	Sodium iron (III) ethylene diamine tetra acetate trihydrate (Sodium feredetate – Na Fe EDTA)	14 to 21.25	
ii)	Folic acid, µg/kg	Folic acid	75 to 125	AOAC 992.05
iii)	Vitamin B_{12}, µg/kg	Cyanocobalamine or Hydroxycobalamine	0.75 to 1.25	IS 16640

Table 2 Requirements for Level of Fortification (Optional Micronutrients)
(*Clause* 3.3)

Sl No.	Micronutrient	Chemical Form of Micronutrient	Level of Fortification	Methods of Test
(1)	(2)	(3)	(4)	(5)
i)	Zinc, mg/kg	Zinc sulphate	10 to 15	15 of IS 1699 or ISO 15151 or ISO 21424
ii)	Vitamin A, µg/kg	Retinyl acetate or Retinyl palmitate	500 RE to 750 RE	IS 16639
iii)	Thiamine, mg/kg	Thiamine hydrochloride or Thiamine mononitrate	1 to 1.5	IS 17669
iv)	Riboflavin, mg/kg	Riboflavin or Riboflavin 5'-phosphate sodium	1.25 to 1.75	IS 17669
v)	Niacin, mg/kg	Nicotinamide or Nicotinic acid	12.5 to 20	IS 17669
vi)	Pyridoxine, mg/kg	Pyridoxine hydrochloride	1.5 to 2.5	IS 17669

Table 3 Limits of Metal Contaminants and Other Toxic Substances
(*Clause* 3.5)

Sl No.	Parameters	Limit	Method of Test, Ref
(1)	(2)	(3)	(4)
i)	Lead, mg/kg, *Max*	0.2	IS 12074
ii)	Cadmium, mg/kg, *Max*	0.1	**15** of IS 1699
iii)	Aflatoxin B_1, µg/kg, *Max*	10.0	IS 16287
iv)	Total aflatoxin, µg/kg, *Max*	15.0	IS 16287
v)	Uric acid, mg/kg, *Max*	100	IS 4333 (Part 5)

Table 4 Physico-Chemical Requirements for Fortified *Atta*
(*Clause* 3.8)

Sl No.	Characteristic	Requirement	Method of Test,Ref to
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	13.5	Annex A of IS 1155
ii)	Total ash (on dry basis), percent by mass, *Max*	2.0	Annex B of IS 1155
iii)	Acid insoluble ash (on dry basis), percent by mass, *Max*	0.10	Annex C of IS 1155
iv)	Gluten (on dry basis), percent by mass, *Min*	6.5	Annex D of IS 1155
vi)	Crude fibre (on dry basis), percent by mass, *Max*	2.5	Annex E of IS 1155
vii)	Alcoholic acidity (as H_2SO_4) in 90 percent alcohol, percent by mass, *Max*	0.18	Annex F of IS 1155

4 PACKING

4.1 The product shall be packed in containers which will safeguard the hygienic, nutritional, technological, organoleptic qualities. The containers, including the packaging material, shall be made of substances which are safe and suitable for their intended use. They should not impart any toxic substances or undesirable odour or flavor to the product. When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

4.2 The product may be packed in DW-flour bags (*see* IS 3984) or HDPE woven sacks (*see* 12100).

5 MARKING

5.1 The ink used for marking shall be of such quality which may not contaminate the product. Each package shall be suitably marked legibly and indelibly to give the following information:

a) Name of the material 'Fortified *Atta'*;
b) Name and address of the manufacturer;
c) Date of packing;
d) Month of manufacture;
e) Lot/batch number;
f) Net quantity;
g) List and levels of the micronutrients along with their chemical form;
h) Storage instruction;
j) Expiry/Use by date;
k) Best before……..month…….year; and
m) Any other information required under the *Legal Metrology (Packaged Commodities) Rules*, 2011 and the *Food Safety and Standards (Labelling and Display) Regulations*, 2020.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act,* 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material for ascertaining conformity to the requirements of this standard shall be drawn according to the method given in IS 14818.

7 TESTS

7.1 All the tests shall be carried out as specified in col 5 of Table 1, col 5 of Table 2, col 4 of Table 3, col 4 of Table 4.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water as reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

ANNEX B
(*Foreword*)

COMMITTEE COMPOSITION

Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee, FAD 16

Organization	*Representative(s)*
ICAR-Central Institute of Post-Harvest Engineering & Technology (CIPHET), Ludhiana	DR NACHIKET KOTWALIWALE **(*Chairperson*)** DR VIJAYALAKSHMI NADENDLA **(*Former Chairperson*)**
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Bureau of Indian Standards

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Review of Indian Standards

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